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Date: 10-4-04

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re patent application of:

Applicant(s): Frederick M. Discenzo

Examiner: Hwa S. Lee

Serial No: 09/406,368

Art Unit: 2877

Filing Date: September 28, 1999

Title: SYSTEM AND METHOD FOR OPTICAL VIBRATION SENSING

**Mail Stop Appeal Brief – Patents  
Commissioner for Patents  
P.O. Box 1450  
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**APPEAL BRIEF**

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Dear Sir:

Applicant submits this brief in connection with an appeal of the above-identified patent application. A credit card payment form is filed concurrently herewith in connection with the \$340.00 fee associated with this brief. In the event any additional fees may be due and/or are not covered by the credit card, the Commissioner is authorized to charge such fees to Deposit Account No. 50-1063 [ALBRP138US].

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**I. Real Party in Interest (37 C.F.R. §41.37(c)(1)(i))**

The real party in interest in the present appeal is Reliance Electric Technologies, LLC., the assignee of the present application.

**II. Related Appeals and Interferences (37 C.F.R. §41.37(c)(1) (ii))**

Appellant, appellant's legal representative, and/or the assignee of the present application are not aware of any appeals or interferences which will directly affect, or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**III. Status of Claims (37 C.F.R. §41.37(c)(1)(iii))**

Claims 8-11 and 33-51 are pending in the application. Claims 8-11 have been allowed. Claims 39 and 40 have been objected to by the Examiner. The rejection of claims 33-38 and 41-51 is being appealed.

**IV. Status of Amendments (37 C.F.R. §41.37(c)(1)(iv))**

Amendment to add new claims 52-58 was introduced subsequent to the Final Office Action but were not entered. No other claim amendments have been entered subsequent to the Final Office Action.

**V. Summary of Claimed Subject Matter (37 C.F.R. §41.37(c)(1)(v))****A. Independent Claim 33**

Independent claim 33 and its corresponding dependent claims relate to a system that determines a vibration state for a machine. (*See e.g.*, Application at p. 3, lines 1-4). The system includes a light receiver that receives light from a source. (*See e.g.*, Application at p. 12, lines 13-14) The system also includes an obscuring body that, based on a particular vibration state of a machine, obscures a portion of light transmitted from the source to the light receiver. (*See e.g.*, Application at page 12, lines 14-17) Also included is a processor that analyzes an amount of light received by the light receiver to determine the particular vibration station. (*See e.g.*, Application at page 4, lines 12-14).

**B. Independent Claim 42**

Independent claim 42 and its corresponding dependent claims relate to a system that senses a vibration level for a machine. (*See e.g.*, Application at p. 3, lines 1-4 ). The system includes a light receiving arrangement that receives light from a source. (*See e.g.*, Application at p. 4, lines 25-26). An obscuring body is included that obscures a light directed upon the light receiving arrangement to cast a shadow fringe on the light receiving arrangement at a particular vibration level of a machine. (*See e.g.*, Application at p. 22, lines 14-15). The remaining light illuminates part or all of the light receiving arrangement as a function of the particular vibration level. (*See e.g.*, Application at p.12, lines 16-17). The system further includes a processor that analyzes the remaining light to determine the particular vibration level of the machine. (*See e.g.*, Application at p. 23, lines 14-15).

**C. Independent Claim 49**

Independent claim 49 and its corresponding dependent claim relates to a method of sensing a vibration state for a machine. (*See e.g.*, Application at p. 3, lines 1-4). The method includes illuminating a light receiving system *via* a light source. (*See e.g.*, Application at p. 4, lines 7-10). The method also includes obfuscating a light directed to the light receiving system to case a shadow fringe upon the light receiving system as a function of the vibration state of a machine. (*See e.g.*, Application at p. 22, lines 19-21). The method further includes analyzing amount of light reaching the light receiving system to determine the vibration state of the machine. (*See e.g.*, Application at p 24, lines 13-19; p. 25, lines 11-17).

**D. Independent Claim 51**

Independent claim 51 relates to a system for sensing a vibration of a machine. (*See e.g.*, Application at p. 5, lines 29-30). The system includes a means for receiving a light transmitted from a light source. (*See e.g.*, Application at p. 5, lines 30 to page 6, line 1; p. 10, lines 28-29; p. 11, lines 1-8; p. 12, lines 18-20, p. 13, lines 19-22, Figs. 2a-2c, 2g-2i, element 60; fig 3a, element 63; figs. 4a and 4g, element 64). The system also includes a means for obscuring a portion of the light directed to the light receiving means

such that a remaining light illuminates part or all of the light receiving means as a function of a vibration of a machine. (*See e.g.*, Application at p. 6, lines 1-2; p. 10, lines 27-28; p. 12, lines 14-23; p. 13, lines 19-29, Figs. 2a-2c, element 52; Figs. 2g-2i, element 52a; Fig. 3a, element 53d; Fig. 4a, element 54d). The system further includes a means for analyzing amount of light received by the light receiving means to determine the particular vibration of the machine. (*See e.g.*, Application at p. 6, lines 3-4; p. 10, lines 7-9; p. 16, lines 4-16; p. 24, lines 13-19; p. 25, lines 11-17; Fig. 1, element 24; Fig 5, element 64).

The “means for” limitations described above are identified as limitations subject to the provisions of 35 U.S.C. § 112¶6. Examples of the corresponding structures are identified with reference to the specification and drawings in the parentheticals above corresponding to those claim limitations.

#### VI. Grounds of Rejection to be Reviewed (37 C.F.R. §41.37(c)(1)(vi))

A. Claims 33-38 stand rejected under 35 U.S.C. §103(a) in view of Udd *et al.* (U.S. 4,471,659); and

B. Claims 41-51 stand rejected under 35 U.S.C. §103(a) in view of Udd *et al.*

#### VII. Argument (37 C.F.R. §41.37(c)(1)(vii))

##### A. Rejection of Claims 33-38 Under 35 U.S.C. §103(a)

Claims 33-38 stand rejected under 35 U.S.C. §103(a) because the Examiner contends that these claims are unpatentable over Udd *et al.* Reversal of this rejection is respectfully requested for at least the following reasons. Udd *et al.* fails to teach or suggest all of the claim limitations. Independent claim 33 recites the limitation *a processor that analyzes an amount of light received by the light receiver to determine the particular vibration state*. As conceded by the Examiner Udd *et al.* does not disclose *a processor that analyzes an amount of light to determine the particular vibration state*.

Because the cited prior art does not teach or suggest the claimed invention as a *whole*, the PTO has failed to establish a *prima facie* case of obviousness.

The test of obviousness is whether “the subject matter sought to be patented and the prior art are such that the subject matter as a *whole* would have been obvious at the time the invention was made to a person having ordinary skill in the art.” (*Graham v. John Deere Co.*, 383 U.S. 1, 3, (1966) (emphasis added); *see also e.g., In re Dembickzak*, 175 F.3d 994, 998, 50 U.S.P.Q. 1614, 1616 (Fed. Cir. 1999)). In evaluating obviousness, the PTO must conduct the factual inquiry as outlined in *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). (*See In re Lee*, 277 F.3d 1338, 1342-42, 61 U.S.P.Q.2d 1430, 1433 (Fed. Cir. 2002)). The factual inquiry to be conducted includes determining: (1) the scope and content of the prior art; (2) the level of ordinary skill in the prior art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness. (*See Graham*, 383 U.S. 1, 17-18 (1966)). The PTO must “not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency’s conclusion.” (*In re Lee*, 277 F.3d at 1344, 61 U.S.P.Q.2d at 1434). The PTO cannot rely merely on conclusory statements and assertions of “common sense” to remedy deficiencies of the cited references. (*In re Lee*, 277 F.3d at 1344, 61 U.S.P.Q.2d at 1434).

In the Final Office Action dated May 20, 2004, it was conceded by the Examiner that Udd *et al.* fails to teach or suggest a “processor analyzes an amount of light received by the light receiver to determine the particular vibration state.” (*See* Final Office Action at p. 3). The Examiner further stated that Udd *et al.* teaches “a suitable electronic processing means is used for quadrature detection ... and that with quadrature detection, a wide range of vibration frequencies and amplitude is determined.” (*See Id.*). The Examiner stated the teaching of Udd *et al.* would render it “obvious to one of ordinary skill in the art that the processor that determines quadrature also determines a particular vibration state such as frequency and amplitude.” (*See Id.*). Applicant’s representative disagrees.

Applicant’s representative noted in the Reply to the Final Office Action dated July 20, 2004, that Udd *et al.* had been misconstrued. Udd *et al.* does not teach or even suggest “that with quadrature detection, a wide range of vibration frequencies and

amplitude is determined.” Rather Udd *et al.* discloses only that quadrature allows the detection of vibration over a wide range of frequencies and amplitudes. (See *e.g.*, Udd *et al.* at Abstract). Udd *et al.* does not disclose or even suggest that the use of quadrature would allow frequencies and amplitude to be determined.

Udd *et al.* discloses two output signals that correspond to the sine and cosine of the phase position of a grating 70 with respect to the *positions* of the gratings 88 and 90 for quadrature detection. (See *e.g.* Udd *et al.*, at col. 3, lines 25-30). In another embodiment Udd *et al.* provides gratings 88 and 90 that are formed on the same plate, but which are *90 degrees out of phase orientation*. (See *e.g.* Udd *et al.* at col. 3, lines 45-59). Additionally, Udd *et al.* discloses that the “signals 190 and 192 are transmitted to suitable electric processing means for quadrature detection of the seismic signal.” (See *e.g.*, Udd *et al.* at col. 4, lines 48-53). Thus, Udd *et al.* merely discloses how to obtain two signals (*via* two output signals, grating orientation or a split inline detector) which are 90 degrees out of phase to apply quadrature detection to determine vibration.

In the Final Office Action the Examiner asserted with reference to Figure 4 of Udd *et al.* that each curve of Figure 4 represents the intensity of light measured by each sensor and these intensity signals are sent to the processor where they are used for quadrature (phase) analysis where one intensity signal is compared to the other intensity signal. However, with reference to the corresponding description of Figure 4 of Udd *et al.* the “two output signals, 92 and 94, *correspond to the sine and cosine* of the phase position of the grating 70 *with respect to the positions of the gratings* 88 and 90.” (See *e.g.*, Udd *et al.* at col. 3, lines 26-28) (emphasis added). Further “the sine and cosine of the phase position can be used to determine the instantaneous relative position of the grating 70 ...” (See Udd, *et al.* at col. 3, lines 33-37). Thus, Figure 4 is merely illustrating the output intensity of the sensor in relationship to the *relative position of gratings*. It is not illustrating anything more than the use of these signals to obtain quadrature detection. Thus, Udd *et al.* discloses that two output signals are required to determine quadrature and does not render obvious the subject invention as recited in the claims.

Since there is no teaching, suggestion or motivation to modify Udd *et al.* to render applicant’s claimed invention absent utilizing applicant’s specification as a 20/20 hind-

sight based roadmap to provide the necessary motivation, it appears the Examiner is basing the rejection *via* employment of applicant's specification on a 20/20 hindsight (blueprint) based reading. Thus, the rationale proffered to modify Udd *et al.* is to achieve benefits identified in applicant's specification rather than in the reference or the knowledge of one having ordinary skill in the art. Applicant's representative respectfully submits that this is an unacceptable and improper basis for a rejection under 35 U.S.C. §103. (See *Interconnect Planning Corporation v. Thomas E. Feil, Robert O. Carpenter, V Band Systems, Inc., and Turret Equipment Corp.*, 774 F.2d 1132, 1138 (Fed. Cir. 1985) (stating the invention must be viewed not with the blueprint drawn by the inventor, but in the state of the art that existed at the time of the invention)). In essence, this rejection is based on the assertion that it would have been obvious to do something not suggested in the art because so doing would provide advantages stated in applicant's specification. This sort of rationale has been condemned by the Court of Appeals for the Federal Circuit. (See *Panduit Corp. v. Dennison Manufacturing Co.*, 1 USPQ2d 1593 (Fed. Cir. 1987)).

The Examiner here has failed to cite prior art that teaches or suggests *every* limitation of the claims. In particular, a ***processor that analyzes an amount of light received by the light receiver to determine the particular vibration state***. Accordingly, the Examiner has failed to establish a *prima facie* case of obviousness. In view of at least the foregoing, the subject claims are in condition for allowance and it is respectfully requested that the rejection of independent claim 33 (and the claims that depend there from) be withdrawn.

**B. Rejection of Claims 41-51 Under 35 U.S.C. §103(a)**

Claims 41-51 stand rejected under 35 U.S.C. §103(a) as being unpatentable in view of Udd *et al.* (U.S. 4,471,659). Reversal of this rejection is respectfully requested for at least the following reasons. Udd *et al.* fails to teach or suggest all the limitations set forth in the subject claims.

Independent claims 42, 49 and 51 recite similar limitations as claim 1, specifically, ***a processor that analysis an amount of light***. As discussed in Section VII(A) *supra*, Udd *et al.* does not teach or even suggest such limitations. Udd *et al.* merely shows how to

obtain two output signals for quadrature detection and does not make obvious the subject invention. Accordingly, the Examiner has failed to establish a *prima facie* case of obviousness. In view of at least the foregoing, rejection of the subject claims should be withdrawn.

### **Conclusion**

For at least the above reasons, the claims currently under consideration are believed to be patentable over the cited reference. Accordingly, it is respectfully requested that the rejections of claims 33-38 and 41-51 be reversed.

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Respectfully submitted,  
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**VIII. Claims Appendix (37 C.F.R. §41.37(c)(1)(viii))**

Claims 1-7 (Cancelled)

Claims 8-11 (Allowed)

Claims 12-17 (Withdrawn)

Claim 18 (Cancelled)

Claims 19-20 (Withdrawn)

Claims 21-32 (Cancelled)

33. A system that determines a vibration state for a machine, comprising:  
a light receiver that receives light from a source;  
an obscuring body that based on a particular vibration state of a machine obscures  
a portion of light transmitted from the source to the light receiver, and  
a processor that analyzes an amount of light received by the light receiver to  
determine the particular vibration state.

34. The system of claim 33, the amount of light received by the light receiver  
increases with increased vibration state of the machine.

35. The system of claim 33, the amount of light received by the light receiver  
decreases with increased vibration state of the machine.

36. The system of claim 33, the obscuring body is a light modulating system.

37. The system of claim 36, the light modulating system includes a housing with a first opening that receives a light beam, a second opening that allows passage of a light beam to the light receiver as a function of a vibration state of the machine.

38. The system of claim 36, the light modulating system is attached to the machine.

39. The system of claim 38, the light modulating system further comprises an annular structure.

40. The system of claim 39, the annular structure permits light to pass in one direction.

41. The system of claim 33, the processor determines a vibration state of the machine based upon an area illuminated on a surface of the light receiver.

42. A system that senses a vibration level for a machine, comprising  
a light receiving arrangement that receives light from a source;  
an obscuring body that obscures a light directed upon the light receiving arrangement to cast a shadow fringe thereupon at a particular vibration level of a machine, the remaining light illuminates part or all of the light receiving arrangement as a function of the particular vibration level, and  
a processor that analyzes the remaining light to determine the particular vibration level of the machine.

43. The system of claim 42, further comprising a reflector that reflects the remaining light on to the light receiving arrangement.

44. The system of claim 42, the processor analyzes an area of the light receiving arrangement that is illuminated *via* the remaining light to determine the particular vibration level of the machine.

45. The system of claim 42, the processor analyzes a non-illuminated area of the light receiving arrangement to determine the particular vibration level of the machine.

46. The system of claim 42 the obscuring body is a light modulator.

47. The system of claim 46 the light modulator is connected to the machine.

48. The system of claim 42 the shadow fringe turns to a complete shadow when the machine reaches a specific vibration level.

49. A method of sensing a vibration state for a machine comprising:  
illuminating a light receiving system *via* a light source;  
obfuscating a light directed to the light receiving system to cast a shadow fringe thereupon as a function of the vibration state of a machine; and  
analyzing amount of light reaching the light receiving system to determine the vibration state of the machine.

50. The method of claim 49 further comprising modulating the light.

51. A system for sensing a vibration of a machine, comprising:  
means for receiving a light transmitted from a light source;  
means for obscuring a portion of the light directed to the light receiving means such that a remaining light illuminates part or all of the light receiving means as a function of a vibration of a machine, and  
means for analyzing amount of light received by the light receiving means to determine the particular vibration of the machine.

52-58. (Not Entered)

**IX. Evidence Appendix (37 C.F.R. §41.37(c)(1)(ix))**

None

**X. Related Proceedings Appendix (37 C.F.R. §41.37(c)(1)(x))**

None